



National Audit Office

**REPORT BY THE
COMPTROLLER AND
AUDITOR GENERAL**

**HC 213
SESSION 2009–2010**

5 FEBRUARY 2010

Major trauma care in England

Summary

1 Major trauma describes serious and often multiple injuries where there is a strong possibility of death or disability. In England, the most common cause is a road accident. We estimate that there are at least 20,000 cases of major trauma each year in England resulting in 5,400 deaths and many others resulting in permanent disabilities requiring long-term care. There are around a further 28,000 cases which, although not meeting the precise definition of major trauma, would be cared for in the same way.

2 There are currently 193 hospitals in England that provide major trauma services within their emergency departments. Major trauma is, however, a minor element of emergency department work equating to less than 0.2 per cent of total activity. We estimate that major trauma costs the NHS between £0.3 and £0.4 billion a year in immediate treatment. The cost of any subsequent hospital treatments, rehabilitation, home care support, or informal carer costs are unknown. We estimate that the annual lost economic output as a result of major trauma is between £3.3 billion and £3.7 billion.

3 Since 1988, a number of studies have identified deficiencies in the care provided to severely injured patients in England. There has, however, been little progress in addressing these deficiencies and recent research has identified a 20 per cent higher in-hospital mortality rate for trauma patients in England compared to the US.

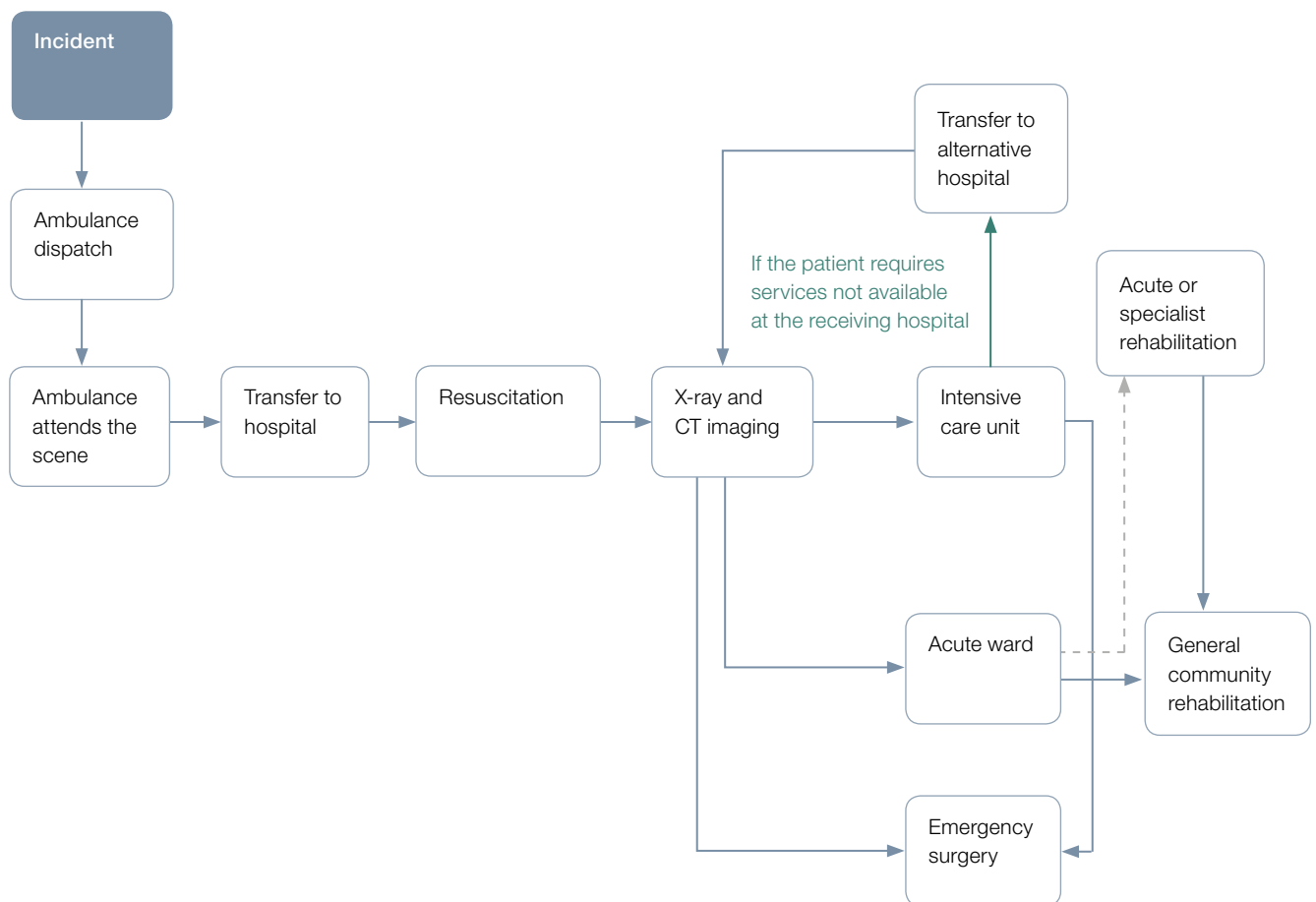
4 In 2008, Lord Darzi's NHS *Next Stage Review*, reported that there were 'compelling arguments for saving lives by creating specialised centres for major trauma' and strategic health authorities were asked to develop regional plans on this basis. No timescales were set for the completion of this process. The Department of Health (the Department) is supporting the work through its Regional Trauma Networks Programme and, on 1 April 2009, appointed the first National Clinical Director for Trauma Care to lead the development of clinical policy. The Director is leading the NHS in delivering the changes required to achieve effective implementation of regional networks and ensuring service engagement in this process (see Part Four page 30).

5 The best data currently available on the quality of major trauma care are collected by the Trauma Audit and Research Network (TARN). These data include pre-hospital times, mechanism of injury, injury severity, times to treatment, length of stay, and outcomes based on mortality. The database uses a model to calculate the likely rates of survival for particular injuries or combinations of injuries, taking into account age, gender and the patient's physical response to their injuries. The database then compares the number of expected survivors against the number of actual survivors to produce a rate of survival for each hospital adjusted by the complexity of the major trauma case.

6 This report evaluates major trauma services in England and identifies what improvements need to be made. We examined the effectiveness of the planning and delivery of services across the patient pathway (**Figure 1**), and the quality of care provided, including patient outcomes. We did not examine the NHS' preparations for unusually large incidents. Our methodologies are set out in Appendix 1. More details can be found on our website at www.nao.org.uk/publications.

Figure 1

The current patient pathway for major trauma



Source: National Audit Office

Overall findings

7 Despite repeated reports identifying poor practice, the Department and NHS trusts have taken very little action to improve major trauma care. Deficiencies in major trauma care were identified by the Royal College of Surgeons in 1988, but there has been little progress since. In 2007, a report by the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) concluded that 60 per cent of major trauma patients received a standard of care that was 'less than good practice'. A number of reports, including one by the NAO in 1992, have made recommendations about the information and actions required to improve the delivery of major trauma care, but there remain significant data gaps and a lack of formalised systems.

8 Survival rates for major trauma vary significantly between hospitals, reflecting variations in the quality of care. Data from TARN, to which 114 hospitals (59 per cent of hospitals delivering trauma care) voluntarily submit trauma data for analyses and comparison, show a range of outcomes following trauma from five unexpected survivors to eight unexpected deaths per 100 trauma patients. The performance of the 41 per cent of trauma receiving hospitals that do not submit data to TARN cannot be gauged.

9 As major trauma is a relatively small part of the work of an emergency department, optimal care cannot be delivered cost-effectively by all hospitals. People who have suffered major trauma often have multiple injuries which need to be treated by different surgical specialties. Whilst specialties such as orthopaedic surgery are commonly available in hospitals, this is not the case for neurosurgery or cardiac surgery. A generally acknowledged solution to this issue is the development of trauma networks where hospitals and the ambulance service work in a coordinated way to provide timely access to specialist care day and night through a system of protocols to deliver the most serious cases to those best equipped to deal with them.

10 Evidence shows that care should be led by consultants experienced in major trauma, but major trauma is most likely to occur at night-time or at weekends when consultants are not present in emergency departments. Having a dedicated consultant present in an emergency department produces quicker and better decision-making in the care of major trauma patients. Yet our evidence indicates that consultants are most likely to be present only between 8am and 8pm Monday to Friday, with night-time and weekend cover provided on an on-call basis. Only one hospital has 24-hour consultant presence seven days a week.

11 The delivery of major trauma care lacks coordination and can lead to unnecessary delays in diagnosis, treatment and surgery. There are currently no formal protocols for determining where people should be taken for treatment, nor a formal system for transferring patients between hospitals. TARN data show that only 36 per cent of patients requiring a transfer from one hospital to another more specialist facility actually get transferred and, for those who are transferred, the efficiency of the process often relies on ad-hoc arrangements. The remaining 64 per cent of patients do not receive specialist care and, as a result, may have a worse outcome.

12 Information on major trauma is not complete and quality of care is not measured by all hospitals. Data on major trauma is either lacking entirely, incomplete or is not brought together in a usable way. Not all hospitals contribute to TARN, and measures of quality almost exclusively focus on death during the initial period of hospitalisation. There are no agreed measures for assessing disability or morbidity and beyond that the physical, social and psychological impact of major trauma on those that survive is not monitored. This lack of data means that it is not possible to fully understand the effectiveness of the current or future organisation of major trauma care.

13 Ambulance trusts have no systematic way of monitoring the standard of care they provide for people who have suffered major trauma and opportunities for improving care may be missed. The clinical governance arrangements (quality and safety) linking pre-hospital and hospital care are weak, and data is not shared. The quality and safety arrangements that are in place in the NHS also do not link with those of voluntary providers such as air ambulance services.

14 The availability of rehabilitation varies widely across the country, and services have not developed on the basis of geographical need. Although rehabilitation may help to reduce length of stay, minimise hospital readmissions, and reduce the use of NHS resources following the initial period of hospitalisation, it has not been considered to any great degree by strategic health authorities in their reviews of major trauma services. There is a widely perceived lack of capacity for the specialist rehabilitation of major trauma patients, but with little hard evidence about what services are currently available and how well they are arranged to meet patient needs, it is difficult to reach a conclusion on this.

15 The costs of major trauma are not fully understood, and there is no national tariff to underpin the commissioning of services. Whilst cost cannot be a primary concern at the point of treatment, funding arrangements for major trauma care do not reflect the true costs incurred by the hospital trusts that treat higher volumes of trauma. If the regional trauma networks now planned are to be successful, trusts need to have appropriate funding arrangements that facilitate the easy transfer of patients to more specialist care and rehabilitation.

Value for money conclusion

16 The case for improving major trauma care in England was made 20 years ago, yet little action has been taken to make improvements since that time, and there remains a lack of accurate and complete information to inform the planning of services and assess the effectiveness of care provided. There are also unacceptable variations in mortality rates, depending on where and when a person receives treatment.

17 The low incidence and high complexity of major trauma means it is important to have well established systems in place, following recognised standards including: 24-hour attendance of consultants with experience in major trauma; major trauma teams in place to coordinate care; by-pass and transfer protocols; and the collection of accurate and complete information on treatment and outcomes. The published literature suggests that where trauma systems have been introduced, in-hospital mortality reduces by 15 to 20 per cent. On the basis of our estimate of 3,000 deaths in hospital from major trauma each year, this suggests an additional 450 to 600 lives could be saved each year across England.

18 The current absence of such systems and standards means that patients do not consistently receive timely and coordinated care, which leads to poorer patient outcomes and, in some cases, death. We conclude that major trauma care in England does not represent value for money because the service is not being delivered efficiently or effectively.

Recommendations

19 It is not feasible, nor efficient to expect all hospitals to have the facilities and skills to provide effective specialist treatment, 24 hours a day, seven days a week when the number of cases of major trauma is relatively small. To deliver improved value for money, major trauma services need to be better coordinated and organised across the patient pathway (Figure 1). We have identified a number of recommendations to improve trauma care through better use of existing resources and some initial investment in the development of networks.

20 The Department is supporting the introduction of trauma networks by strategic health authorities. However, given the lack of progress made in improving major trauma services over the last 20 years, we recommend that the following interim actions should be taken by September 2011:

- a** **Primary care trusts and ambulance trusts should** develop and implement triage protocols to determine which emergency departments seriously injured patients should be taken for treatment. This work **should be coordinated by strategic health authorities**.
- b** **Primary care trusts should** use their commissioning powers to require all acute and foundations trusts with emergency departments that receive trauma patients to submit data to TARN. The data collected should be used to inform the ongoing development of trauma networks.
- c** **Strategic health authorities with hospital trusts should** develop protocols for the transfer of patients requiring specialist care or surgical procedures not available at the receiving hospital.

21 Once implemented, the interim measures set out above will help underpin the development and operation of optimal trauma networks. However, if trauma networks are to succeed in the long term, the following issues must also be addressed:

- a** There remains a lack of accurate and complete information in hospitals and ambulance trusts on the treatment of people who suffer major trauma. In addition, other than mortality rates, there is also no information on patient outcomes. Without much improved data, it will be difficult to plan networked services effectively, and improve both quality and safety.
 - i** Working with the **Department, strategic health authorities should** develop measures of outcomes to enable the quality of major trauma services to be better assessed. These measures should cover the entire patient pathway from pre-hospital care through to acute care and rehabilitation.
 - ii** Using TARN data, **hospital trusts should** benchmark performance with other trusts to help identify best practice and ways to improve patient care.
 - iii** To meet their quality and safety (clinical governance) requirements, **ambulance trusts should** collect data on the resources dispatched and treatment provided, and link it with data collected by NHS acute trusts in order to monitor the quality and safety of care provided in the pre-hospital environment. These data should be used to identify the need for improvements in patient care.
 - iv** TARN data and ambulance trust data should be routinely analysed by **strategic health authorities** and **primary care trusts**, and used to performance manage trauma networks.
- b** There is a need to have clear standards and protocols in place so that major trauma patients are efficiently delivered to those best equipped to deal with them.
 - i** **The Department should** work with the National Institute for Health and Clinical Excellence (NICE) to develop standards for major trauma care. For example, these quality standards should recommend that there is 24-hour consultant presence in emergency departments treating major trauma patients.
 - ii** **Strategic health authorities should** work with **primary care trusts, ambulance trusts, hospital trusts and social care providers** to develop protocols for the effective delivery of major trauma care against the standards set by NICE. For example, protocols to ensure that computed tomography (CT) scans are undertaken within the times recommended by clinical guidelines.
 - iii** **Hospital and ambulance trusts should** develop procedures through which they can obtain assurance that defined clinical standards are being followed by their staff. These should also be agreed with pre-hospital care providers operating outside of NHS funding arrangements, such as air ambulances.

- iv **Strategic health authorities and hospital trusts should** develop protocols for improving the overall management of critical care capacity for all patients so as to reduce the transfer of patients for non-clinical reasons.
- c Major trauma patients often have complex neurological and physical problems which can require long-term care. There is clinical evidence which shows that early coordinated rehabilitation leads to better outcomes for a patient and can reduce the use of NHS services in the long term. However, little is known about existing capacity in rehabilitation services in both hospital and community settings, and whether this capacity is used well.
 - i **Strategic health authorities should** review the current organisation of rehabilitation services when considering their plans for developing trauma networks. This review should include examination of existing use and capacity of rehabilitation services for major trauma, and the identification of good practice where it may exist.